



DEUTSCHES HERZZENTRUM
DER CHARITÉ



Prof. Dr. Christoph Starck, FEHRA

Same-Day TLE – Sondenextraktion als ambulante

Prozedur? Wenn ja, wann?



Conflict of interest statement:

Prof. Dr. Christoph Starck

- Angiodynamics: – Consulting & speaker honoraria
- Abiomed: – Speaker honoraria
- Atricure: – Consulting & speaker honoraria
- Biotronik: – Consulting honoraria, Research support
- Boston Scientific: – Consulting honoraria
- Cook Medical: – Workshop honoraria, consulting honoraria, research support, educational grant
- Getinge: – Speaker honoraria, travel expenses
- Liva Nova: – Speaker honoraria, travel expenses
- Medtronic: – Consulting honoraria, travel expenses
- Philips: – Speaker honoraria, travel expenses
- Abbott: – Research support



NEW
INSIGHT...

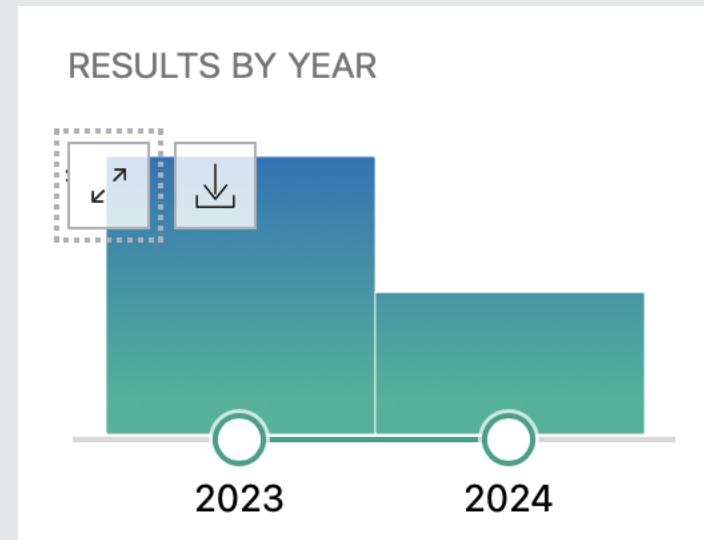
Same-day discharge after TLE

PubMed[®]

[Advanced](#) [Create alert](#) [Create RSS](#) [User Guide](#)

Sort by:

MY NCBI FILTERS 4 results << < Page 1 of 1 > >>



#1

Same-day discharge after TLE



ESC

European Society
of Cardiology

Europace (2023) **25**, 586–590

<https://doi.org/10.1093/europace/euac185>

CLINICAL RESEARCH

Same-day discharge after transvenous lead extraction: feasibility and outcomes

**Gourg Atteya ^{1*}, Michael Alston ¹, Austin Sweat ¹, Moussa Saleh ¹,
Stuart Beldner¹, Raman Mitra¹, Jonathan Willner ¹, Roy M. John²,
and Laurence M. Epstein ¹**

Same-day discharge protocol

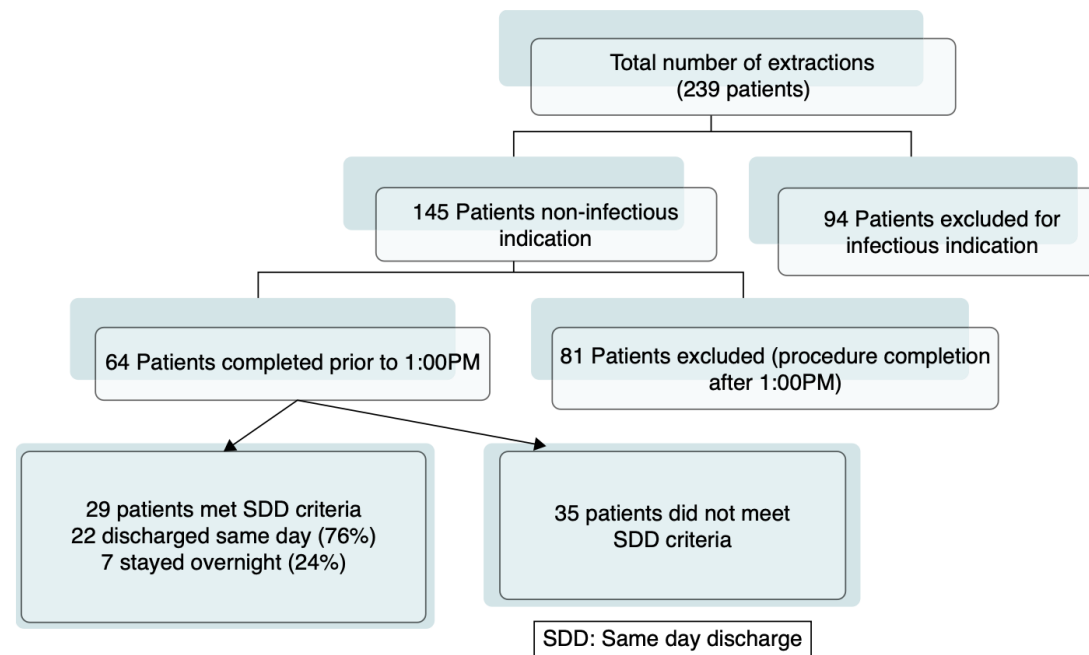
ESC
European Society
of Cardiology

Europe (2023) 25, 586–590
<https://doi.org/10.1093/eurheart/ehac185>

CLINICAL RESEARCH

Same-day discharge after transvenous lead extraction: feasibility and outcomes

Gourg Atteya ¹, Michael Alston ¹, Austin Sweat ¹, Moussa Saleh ¹, Stuart Beldner ¹, Raman Mitra ¹, Jonathan Willner ¹, Roy M. John ², and Laurence M. Epstein ¹



SDD Exclusion criteria:

- Infectious indications
- < 6h post extraction observation/recovery time (procedure end after 1:00 PM)
- Anticoagulation issues requiring overnight stay
- Patient's social situation
- physician and/or patient judgment that precludes SDD (e.g. procedural complications, uncontrolled co-morbidities, advanced age, and unfavourable distance/time/transportation to travel home)

Same-day discharge after TLE

Same-day discharge after transvenous lead extraction: feasibility and outcomes

Gourg Attaya ¹*, Michael Alston ¹, Austin Sweat ¹, Moussa Saleh ¹, Stuart Beldner¹, Raman Mitra¹, Jonathan Willner ¹, Roy M. John², and Laurence M. Epstein ¹

Table 1 Baseline characteristics of SDD group

Baseline characteristics	SDD (22 patients)
Age (years)	65.9 ± 12 (47–84)
Female sex (%)	41
BMI (kg/m ²)	29.7 ± 6
Medical history	
HTN (%)	77
DM (%)	18
CHF (%)	50
CAD (%)	18
CVA/PE/DVT (%)	14
AFib/flutter (%)	32
CKD (%)	0
Prior cardiac surgery (%)	18
CHA2DS2-VASc score	3
Left ventricular ejection fraction (%)	52.2 ± 18 (10–80)
Distance from home to our institution (miles)	138.5 ± 518 (3–2454)

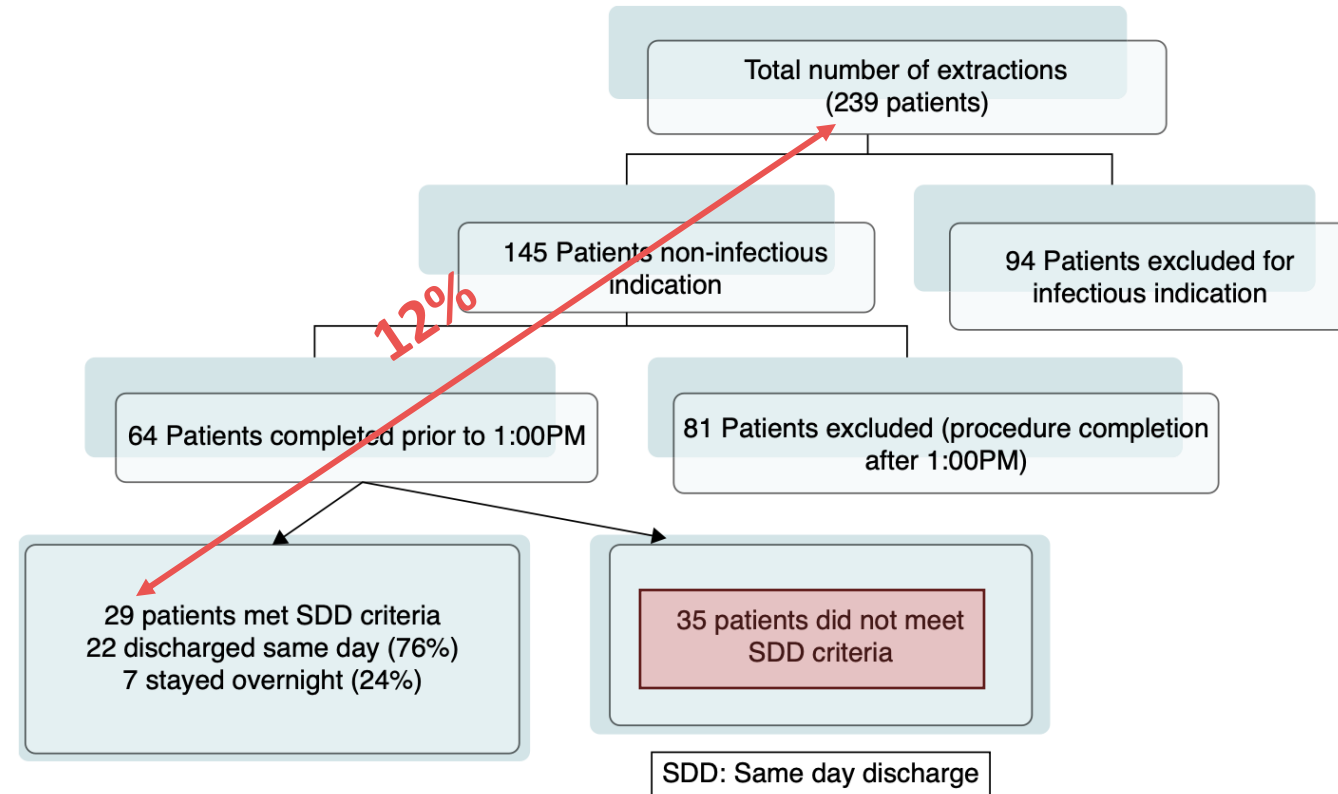
Table 2 Extraction and re-implant details in SDD group

Procedural details	SDD group (%)
ICD extraction	4 (18), 100% dual coil
ICD	4
CRT-D	None
Pacemaker extraction	17 (77)
CRT extraction (CRT-P)	1 (5)
Total leads extracted per patient	1.8 ± 1, range 1–3
Average age of oldest lead extracted (years)	9.6 ± 6, range 1.5–21.7
LED score	11.6 ± 7, range 2.5–23.7
CIED re-implant	20 (91)
Pacemaker re-implant	15
Transvenous	11 (55)
Leadless	None
CRT-P	4 (20)
ICD re-implant	5
ICD	2 (10)
CRT-D	3 (15)

Same-day discharge protocol

Same-day discharge after transvenous lead extraction: feasibility and outcomes

Gourg Atteya ¹, Michael Alston ¹, Austin Sweat ¹, Moussa Saleh ¹,
Stuart Beldner ¹, Raman Mitra ¹, Jonathan Willner ¹, Roy M. John ²,
and Laurence M. Epstein ¹



#2

Same-day discharge after TLE

Safety of same-day discharge after lead extraction procedures



Lilas Dagher, MD, Mohamad Ali Tfaily, MD, Michael Vavuranakis, MD, Neal Kumar Bhatia, MD, Stacy B. Westerman, MD, MPH, Anand D. Shah, MD, Michael S. Lloyd, MD, FHRS, Miguel Leal, MD, FHRS, David B. De Lurgio, MD, FHRS, Alam Merchant, MD, Anastasios Panagopoulos, MD, Anshul M. Patel, MD, FHRS, Christine Tompkins, MD, FHRS, Angel R. Leon, MD, Faisal M. Merchant, MD, FHRS, Mikhael F. El-Chami, MD, FHRS

From the Division of Cardiology, Section of Electrophysiology, Emory University School of Medicine, Atlanta, Georgia.

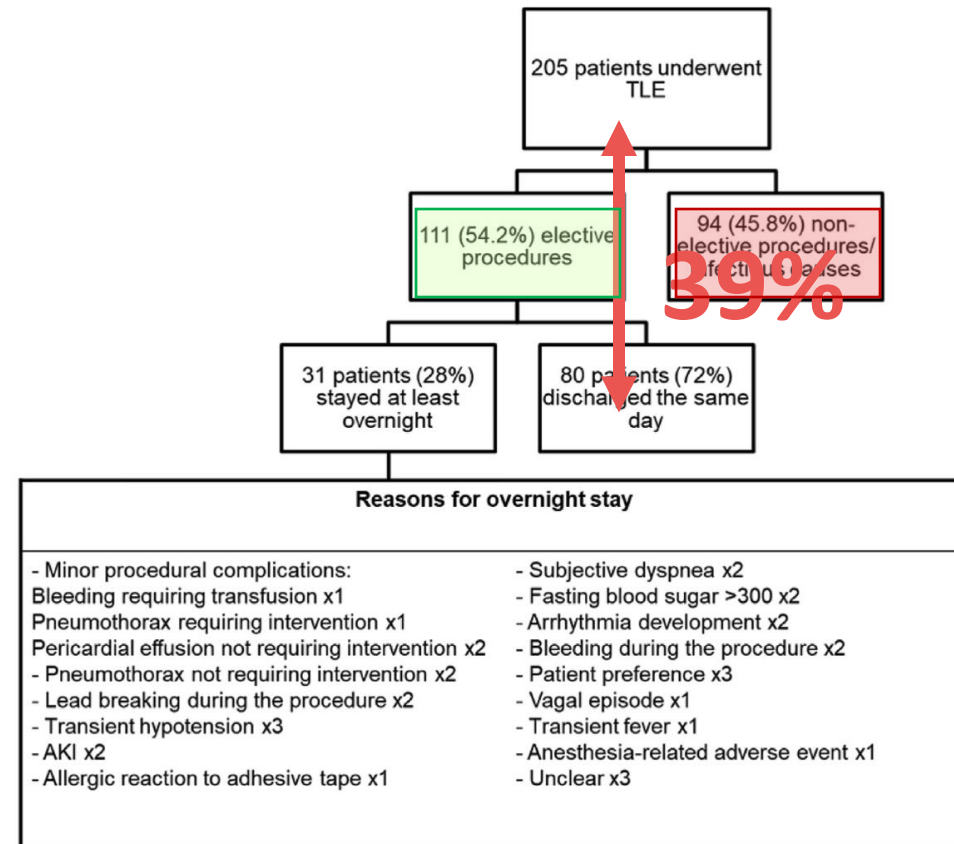


Figure 1 Flow diagram including documented reasons for overnight stay. AKI = acute kidney injury; TLE = transvenous lead extraction.

Same-day discharge after TLE

Safety of same-day discharge after lead extraction procedures



Lilas Dagher, MD, Mohamad Ali Tfaily, MD, Michael Vavuranakis, MD, Neal Kumar Bhatia, MD, Stacy B. Westerman, MD, MPH, Anand D. Shah, MD, Michael S. Lloyd, MD, FHRS, Miguel Leal, MD, FHRS, David B. De Lurgio, MD, FHRS, Alam Merchant, MD, Anastasios Panagopoulos, MD, Anshul M. Patel, MD, FHRS, Christine Tompkins, MD, FHRS, Angel R. Leon, MD, Faisal M. Merchant, MD, FHRS, Mikhael F. El-Chami, MD, FHRS

From the Division of Cardiology, Section of Electrophysiology, Emory University School of Medicine, Atlanta, Georgia.

Table 1 Baseline characteristics of patients who were discharged the same day and those who stayed overnight

Characteristic	Same-day discharge	Overnight stay	P
Age (y)	66 ± 13	62 ± 18	.214
Female sex	38 (47.50)	10 (32.30)	.146
BMI (kg/m ²)	30.37 ± 6.91	26.86 ± 6.03	.015
CHF	45 (57.70)	17 (56.70)	.821
CAD/MI	30 (37.50)	13 (41.90)	.667
CKD	11 (13.80)	4 (12.90)	.907
DMII	18 (22.50)	8 (25.80)	.712
Smoking	18 (22.80)	4 (12.90)	.244

Table 2 Procedural characteristics in each group

Characteristic	Same-day discharge (80 patients)	Overnight stay (31 patients)	P
No. of leads extracted	1 ± 1	2 ± 1	.045
Lead dwell time			
Mean (y)	5.31 ± 5.5	7.25 ± 4.91	
<10 y	64 (80.00)	19 (61.30)	.042
≥10 y	16 (20.00)	12 (38.70)	
Lead type			
Single-coil ICD	22 (27.50)	11 (35.50)	.863
Dual-coil ICD	11 (13.80)	2 (6.5)	
LED score	6.78 ± 5.91	8.96 ± 5.29	.079
Indication for lead extraction			.708
Lead dislodgment/entrapment	15 (18.8)	9 (29)	
Lead malfunction/fracture	38 (47.5)	12 (38.7)	
Upgrade	17 (21.30)	6 (19.40)	
Other*	10 (12.50)	4 (12.90)	
Leads/devices added on the same day	65 (81.30)	29 (93.50)	.106
Mechanical extraction technique	32 (40.50)	18 (58.10)	.09
Laser sheath	14 (17.50)	14 (45.20)	.003
Procedural success	77 (96.25)	29 (93.60)	.107
Clinical success	80 (100)	31 (100)	>.99

Same-day discharge after TLE

Safety of same-day discharge after lead extraction procedures



Lilas Dagher, MD, Mohamad Ali Tfaily, MD, Michael Vavuranakis, MD, Neal Kumar Bhatia, MD, Stacy B. Westerman, MD, MPH, Anand D. Shah, MD, Michael S. Lloyd, MD, FHRS, Miguel Leal, MD, FHRS, David B. De Lurgio, MD, FHRS, Alam Merchant, MD, Anastasios Panagopoulos, MD, Anshul M. Patel, MD, FHRS, Christine Tompkins, MD, FHRS, Angel R. Leon, MD, Faisal M. Merchant, MD, FHRS, Mikhael F. El-Chami, MD, FHRS

From the Division of Cardiology, Section of Electrophysiology, Emory University School of Medicine, Atlanta, Georgia.

One minor complication post discharge:

- One patient admitted to ER with swelling & tenderness pocket
 - discharged on the same day

no other minor complications up to 30 days

No major complications

Same-day discharge after TLE

Safety of same-day discharge after lead extraction procedures



Lilas Dagher, MD, Mohamad Ali Tfaily, MD, Michael Vavuranakis, MD, Neal Kumar Bhatia, MD, Stacy B. Westerman, MD, MPH, Anand D. Shah, MD, Michael S. Lloyd, MD, FHRS, Miguel Leal, MD, FHRS, David B. De Lurgio, MD, FHRS, Alam Merchant, MD, Anastasios Panagopoulos, MD, Anshul M. Patel, MD, FHRS, Christine Tompkins, MD, FHRS, Angel R. Leon, MD, Faisal M. Merchant, MD, FHRS, Mikhael F. El-Chami, MD, FHRS

From the Division of Cardiology, Section of Electrophysiology, Emory University School of Medicine, Atlanta, Georgia.

Table 3 Multivariate predictors of same-day discharge after TLE

Variable	aOR	95% CI for aOR		P
		Lower	Upper	
Female sex	0.56	0.21	1.51	.255
BMI	0.91	0.84	0.997	.044
Leads/devices added on the same day	3.62	0.68	19.20	.131
Use of laser sheath	3.52	1.27	9.78	.016
Number of leads extracted	1.61	0.82	3.16	.167
Use of mechanical technique	1.28	0.49	3.38	.613
Lead dwell time	0.93	0.29	2.92	.895

#3

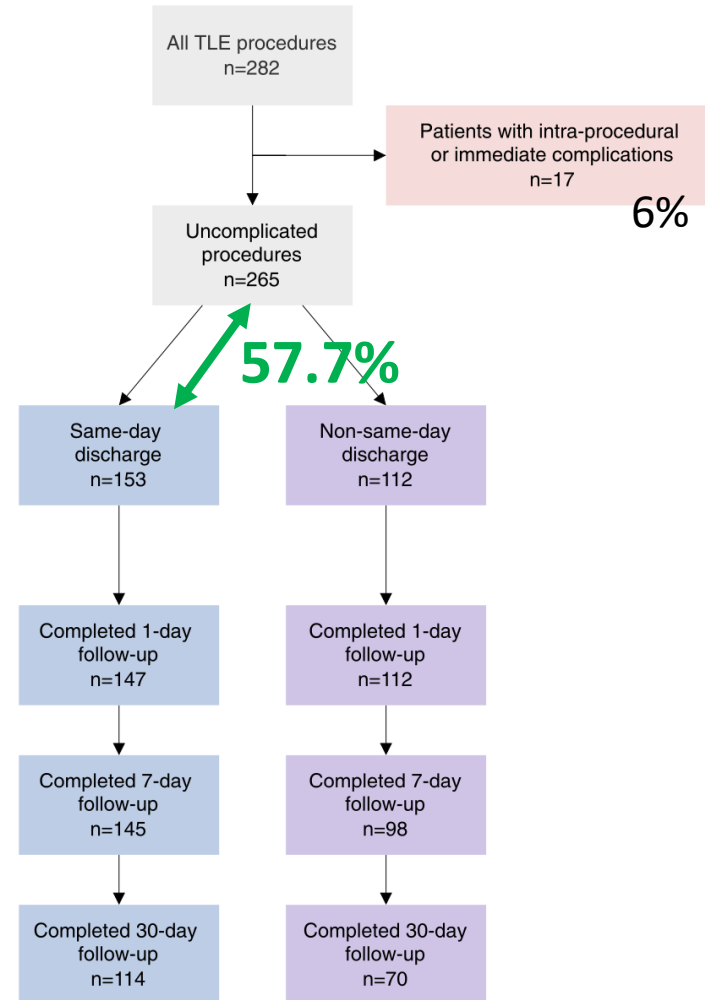
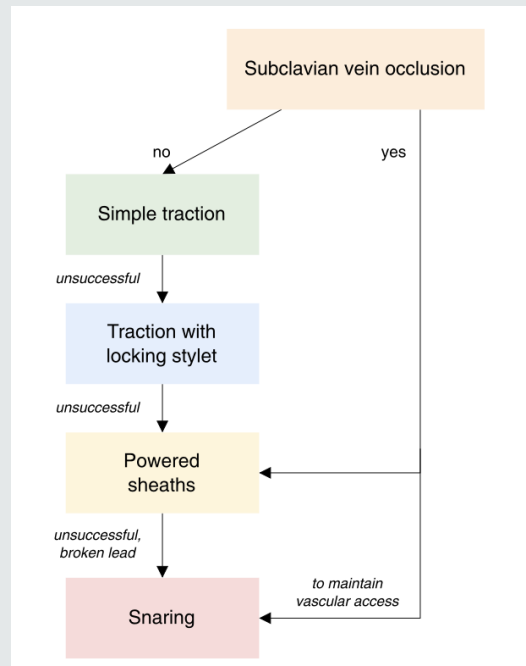
Same-day discharge after TLE

ORIGINAL ARTICLE

WILEY

Safety and feasibility of same-day discharge following uncomplicated transvenous lead extraction

Carola Gianni MD¹ | Mohanad Elchouemi BS¹ | Rami Helmy¹ |
 Lauryn Spinetta BS^{2,3} | Vincenzo Mirco La Fazia MD¹ | Nicola Pierucci MD^{1,4} |
 Issa Asfour MD^{1,5} | Domenico G. Della Rocca MD¹ | Sanghamitra Mohanty MD¹ |
 Mohamed A. Bassiouny MD¹ | Paul C. Coffeen MD¹ | Patrick M. Hranitzky MD¹ |
 Robert C. Neely MD³ | Andrea Natale MD^{1,6,7,8} | Robert C. Canby MD¹ |
 Amin Al-Ahmad MD¹



Same-day discharge after TLE

ORIGINAL ARTICLE

WILEY

Safety and feasibility of same-day discharge following uncomplicated transvenous lead extraction

Carola Gianni MD¹ | Mohanad Elchouemi BS¹ | Rami Helmy¹ |
Lauryn Spinetta BS^{2,3} | Vincenzo Mirco La Fazio MD¹ | Nicola Pierucci MD^{1,4} |
Issa Asfour MD^{1,5} | Domenico G. Della Rocca MD¹ | Sanghamitra Mohanty MD¹ |
Mohamed A. Bassiouny MD¹ | Paul C. Coffeen MD¹ | Patrick M. Hranitzky MD¹ |
Robert C. Neely MD³ | Andrea Natale MD^{1,6,7,8} | Robert C. Canby MD¹ |
Amin Al-Ahmad MD¹

TABLE 1 Baseline characteristics.

	Overall n = 265	SDD n = 153	non-SDD n = 112	Difference between means (95% CI)	p Value
Age (years)	67 ± 14	66 ± 14	68 ± 15	−2 (−5 to 2)	ns
Female sex	112 (42%)	73 (48%)	39 (35%)		.0439
BMI (kg/m ²)	29.5 ± 7.7	30.1 ± 8.0	28.7 ± 7.2	1.4 (−0.5 to 3.3)	ns
Obesity ^a	106 (40%)	62 (41%)	44 (39%)		ns
Hypertension	185 (70%)	101 (66%)	84 (75%)		ns
Diabetes mellitus	82 (31%)	36 (24%)	46 (41%)		.0030
Atrial fibrillation	143 (54%)	75 (49%)	68 (61%)		ns
Coronary artery disease	126 (48%)	65 (42%)	61 (54%)		ns
Valvular heart disease	53 (20%)	29 (19%)	24 (21%)		ns
Prior sternotomy	66 (25%)	30 (20%)	36 (32%)		.0220
Cardiomyopathy	179 (68%)	102 (67%)	77 (69%)		ns
LVEF (%) ^b	45 ± 14	45 ± 14	44 ± 14	1 (−2 to 5)	ns
Systolic heart failure	145 (55%)	81 (53%)	64 (57%)		ns
Chronic kidney disease	55 (21%)	21 (14%)	34 (30%)		.0012
COPD	29 (11%)	11 (7.2%)	18 (16%)		.0282
Indication for TLE					
Noninfectious indication	194 (73%)	142 (93%)	52 (46%)		<.0001
Lead malfunction	135 (51%)	90 (59%)	35 (31%)		<.0001
Device revision	42 (16%)	30 (20%)	12 (11%)		ns
Vein occlusion	11 (4.2%)	8 (5.3%)	3 (2.7%)		ns
Other	6 (2.3%)	5 (3.3%)	1 (0.9%)		ns
Infectious indication	71 (27%)	11 (7.2%)	60 (53%)		<.0001
Isolated pocket infection	33 (12%)	9 (5.9%)	24 (21%)		.0002
Lead infection/bacteremia	38 (14%)	2 (1.3%)	36 (32%)		<.0001

TABLE 2 Procedural characteristics.

	Overall n = 265	SDD n = 153	non-SDD n = 112	Difference between means (95% CI)	p Value
Single operator	214 (81%)	126 (82%)	88 (79%)		ns
LED score ^a	10.5 ± 6.3	10.2 ± 6.0	11.0 ± 6.6	−0.8 (−2.4 to 0.7)	ns
Extracted leads (n)	1.8 ± 0.9	1.6 ± 0.7	2.1 ± 1.0	−0.5 (−0.7 to −0.3)	<.0001
Device type, ICD	133 (50%)	78 (51%)	55 (49%)		ns
Odest lead dwell time (months)	103 ± 70	100 ± 69	106 ± 71	−6 (−23 to 11)	ns
Trans-femoral approach	11 (4.1%)	4 (2.6%)	7 (6.3%)		ns
To maintain vascular access	8 (3.0%)	4 (2.6%)	4 (3.6%)		ns
For lead retrieval/extraction	3 (1.1%)	0 (0%)	3 (2.7%)		ns
Powered sheath-assisted TLE	195 (74%)	112 (73%)	83 (74%)		ns
Laser	195 (74%)	112 (73%)	83 (74%)		ns
Laser pulses (pulses)	3194 ± 3382	2595 ± 2899	3985 ± 3805	−1390 (−2337 to −444)	.0036
Mechanical rotational	13 (4.9%)	3 (2.0%)	10 (8.9%)		.0177
Complete success ^b	244 (92%)	141 (92%)	103 (92%)		ns
Procedure time (min)	93 ± 55	85 ± 39	105 ± 71	−20 (−31 to −9)	<.0001
Fluoroscopy time (min) ^c	13.4 ± 14.3	11.8 ± 8.8	16.0 ± 19.8	−4.2 (−8.2 to −0.3)	.0374
AK (mGy) ^c	169 ± 247	161 ± 214	180 ± 290	−18 (−88 to 51)	ns
DAP (μGy × m ²) ^c	3456 ± 4812	3446 ± 4373	3472 ± 5442	−26 (−1378 to 1325)	ns
Same-day reimplant	201 (76%)	132 (86%)	70 (63%)		<.0001
End time before 12:00	192 (72%)	126 (82%)	66 (59%)		<.0001

Same-day discharge after TLE

ORIGINAL ARTICLE

WILEY

Safety and feasibility of same-day discharge following uncomplicated transvenous lead extraction

Carola Gianni MD¹ | Mohanad Elchouemi BS¹ | Rami Helmy¹ |
 Lauryn Spinetta BS^{2,3} | Vincenzo Mirco La Fazia MD¹ | Nicola Pierucci MD^{1,4} |
 Issa Asfour MD^{1,5} | Domenico G. Della Rocca MD¹ | Sanghamitra Mohanty MD¹ |
 Mohamed A. Bassiouny MD¹ | Paul C. Coffeen MD¹ | Patrick M. Hranitzky MD¹ |
 Robert C. Neely MD³ | Andrea Natale MD^{1,6,7,8} | Robert C. Canby MD¹ |
 Amin Al-Ahmad MD¹

TABLE 4 Rate of patients with major procedure-related complications at 1-, 7-, and 30-days.

	Overall	SDD	Non-SDD	p Value
1-day	n = 259	n = 147	n = 112	
All major complications	2 (0.77%)	0 (0%)	2 ^a (1.8%)	ns
Death	1 (0.39%)	0 (0%)	1 (0.89%)	ns
Permanent sequelae	0 (0%)	0 (0%)	0 (0%)	ns
Hospitalization	1 (0.39%)	0 (0%)	1 (0.89%)	ns
7-days	n = 243	n = 145	n = 98	
All major complications	11 (4.5%)	3 (2.1%)	8 ^b (8.2%)	.0308
Death	2 (0.82%)	0 (0%)	2 (2.0%)	ns
Permanent sequelae	0 (0%)	0 (0%)	0 (0%)	ns
Hospitalization	9 (3.7%)	3 (2.1%)	6 (6.1%)	ns
30 days	n = 184	n = 114	n = 70	
All major complications	15 (8.2%)	4 (3.5%)	11 ^c (16%)	.0049
Death	2 (1.1%)	0 (0%)	2 (2.9%)	ns
Permanent sequelae	0 (0%)	0 (0%)	0 (0%)	ns
Hospitalization	13 (7.1%)	4 (3.5%)	9 (13%)	0.0338

TABLE 3 Major procedure-related complications in the study population.

	Overall n = 31	SDD n = 8	Non-SDD n = 23
Death	5	0	5
Unknown cause	3	0	3
Procedure-related ^a	2	0	2
Cerebrovascular accident	0	0	0
Acute heart failure	1	0	1
Pericardial effusion	0	0	0
Pericarditis	2	2	0
Tricuspid valve injury	0	0	0
Acute respiratory failure	2	0	2
Pulmonary embolism	0	0	0
Pneumothorax	0	0	0
Hemothorax	0	0	0
Surgical site infection	4	1	3
Device infection	1	1	0
Pocket hematoma	7	2	5
Deep venous thrombosis	1	1	0
Lead dislodgement	1	1	0
Femoral vascular access-related complications	2	0	2
Acute kidney injury	3	0	3
Other ^b	2	0	2

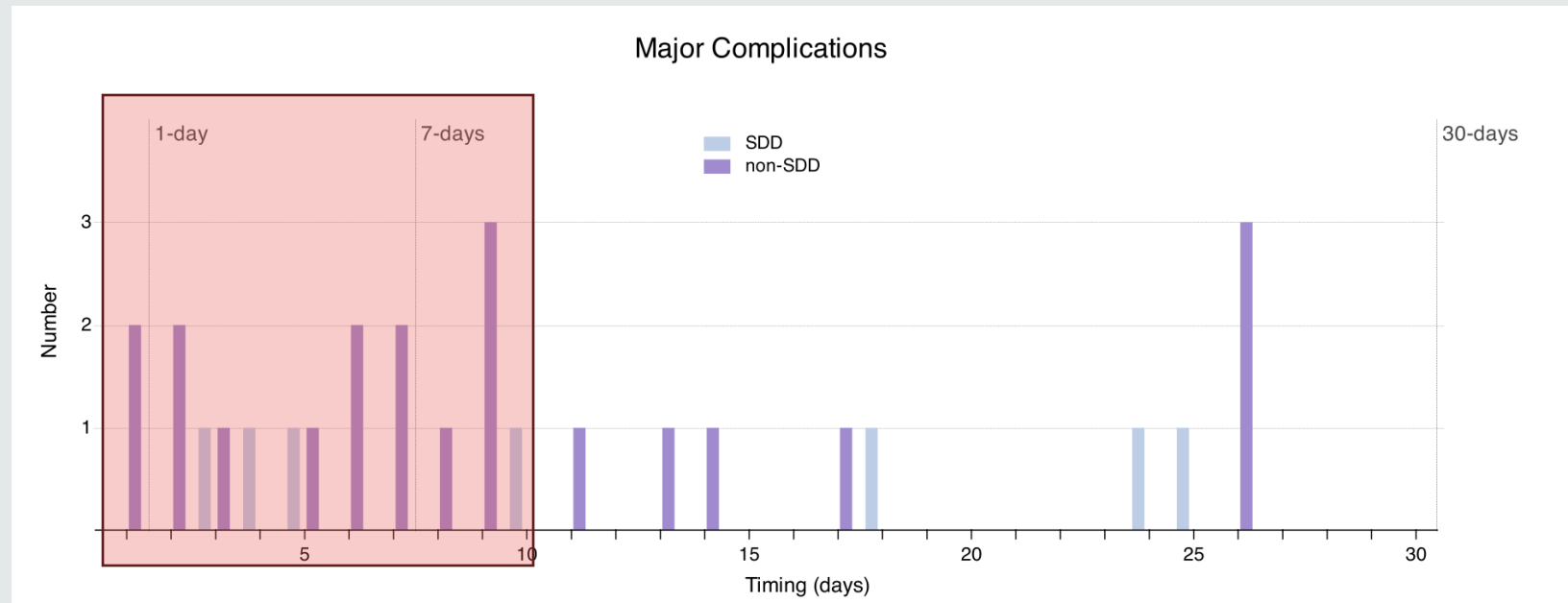
Same-day discharge after TLE

ORIGINAL ARTICLE

WILEY

Safety and feasibility of same-day discharge following uncomplicated transvenous lead extraction

Carola Gianni MD¹ | Mohanad Elchouemi BS¹ | Rami Helmy¹ |
Lauryn Spinetta BS^{2,3} | Vincenzo Mirco La Fazia MD¹ | Nicola Pierucci MD^{1,4} |
Issa Asfour MD^{1,5} | Domenico G. Della Rocca MD¹ | Sanghamitra Mohanty MD¹ |
Mohamed A. Bassiouny MD¹ | Paul C. Coffeen MD¹ | Patrick M. Hranitzky MD¹ |
Robert C. Neely MD³ | Andrea Natale MD^{1,6,7,8} | Robert C. Canby MD¹ |
Amin Al-Ahmad MD¹



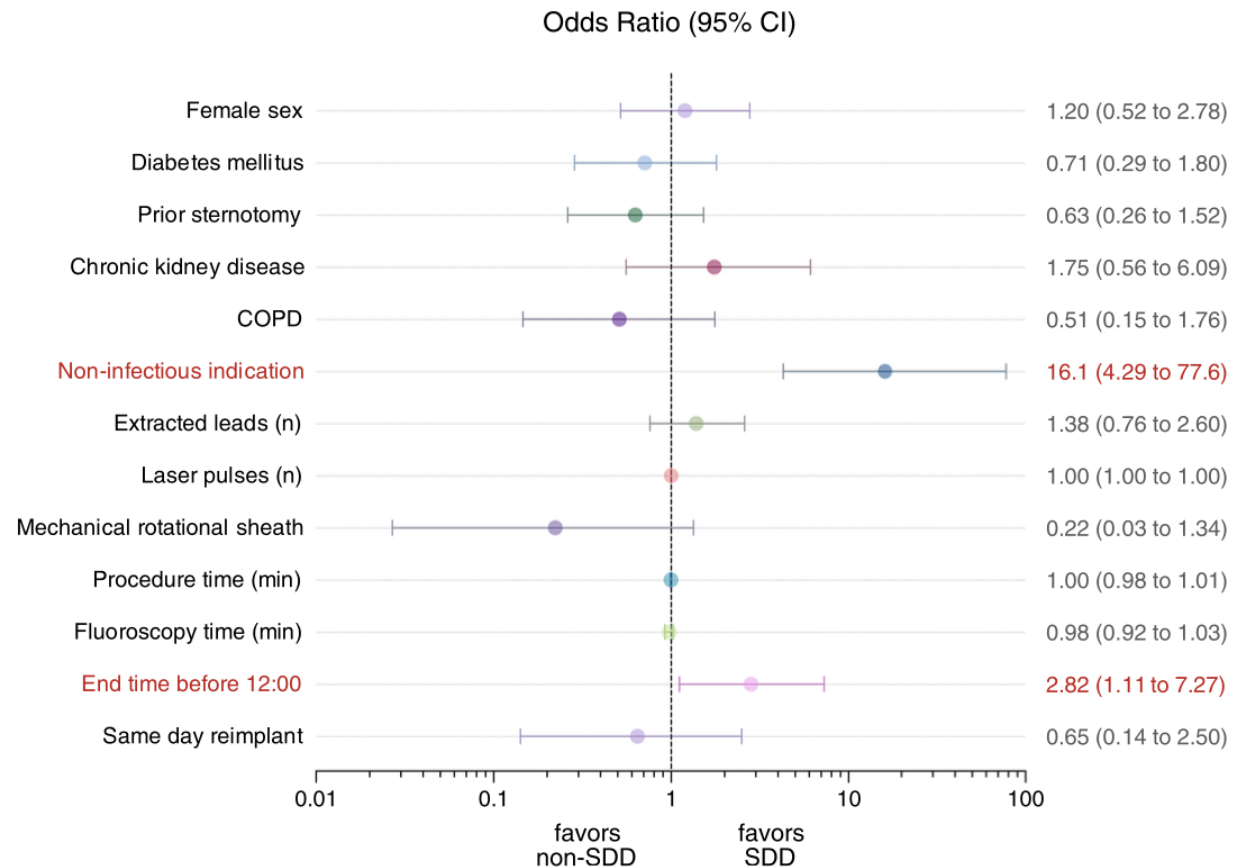
Same-day discharge after TLE

ORIGINAL ARTICLE

WILEY

Safety and feasibility of same-day discharge following uncomplicated transvenous lead extraction

Carola Gianni MD¹ | Mohanad Elchouemi BS¹ | Rami Helmy¹ |
Lauryn Spinetta BS^{2,3} | Vincenzo Mirco La Fazia MD¹ | Nicola Pierucci MD^{1,4} |
Issa Asfour MD^{1,5} | Domenico G. Della Rocca MD¹ | Sanghamitra Mohanty MD¹ |
Mohamed A. Bassiouny MD¹ | Paul C. Coffeen MD¹ | Patrick M. Hranitzky MD¹ |
Robert C. Neely MD³ | Andrea Natale MD^{1,6,7,8} | Robert C. Canby MD¹ |
Amin Al-Ahmad MD¹



Same-day discharge after TLE

ORIGINAL ARTICLE

WILEY

Safety and feasibility of same-day discharge following uncomplicated transvenous lead extraction

Carola Gianni MD¹ | Mohanad Elchouemi BS¹ | Rami Helmy¹ |
Lauryn Spinetta BS^{2,3} | Vincenzo Mirco La Fazia MD¹ | Nicola Pierucci MD^{1,4} |
Issa Asfour MD^{1,5} | Domenico G. Della Rocca MD¹ | Sanghamitra Mohanty MD¹ |
Mohamed A. Bassiouny MD¹ | Paul C. Coffeen MD¹ | Patrick M. Hranitzky MD¹ |
Robert C. Neely MD³ | Andrea Natale MD^{1,6,7,8} | Robert C. Canby MD¹ |
Amin Al-Ahmad MD¹

Conclusion: SDD discharge following uncomplicated TLE in selected patients (i.e., those without device infection and when the TLE procedure is completed in the morning) is feasible and safe.

#4

Same-day discharge after TLE

INVITED EDITORIAL

WILEY

Same day discharge after transvenous lead extraction: Balancing safety and efficiency

Mikhael F. El-Chami MD 

*Division of Cardiology, Section of Electrophysiology,
Emory University School of Medicine, Atlanta, Georgia, USA*

Based on the data we have, patients who meet the below criteria might benefit from SDD after TLE.

1. Patients with noninfectious indications for TLE.
2. Patients who could be monitored for 3–4 h postprocedure (early procedure time).
3. Patients with good social support.
4. Patients with no obvious complications.
5. When physician and patient judgment aligns with the decision of SDD.

...and now?

SAME-DAY TLE...

Pushing the limits...?



➤ SAME DAY DISCHARGE PROTOCOL

TLE as SAME-DAY-PROCEDURE

Inclusion criteria:

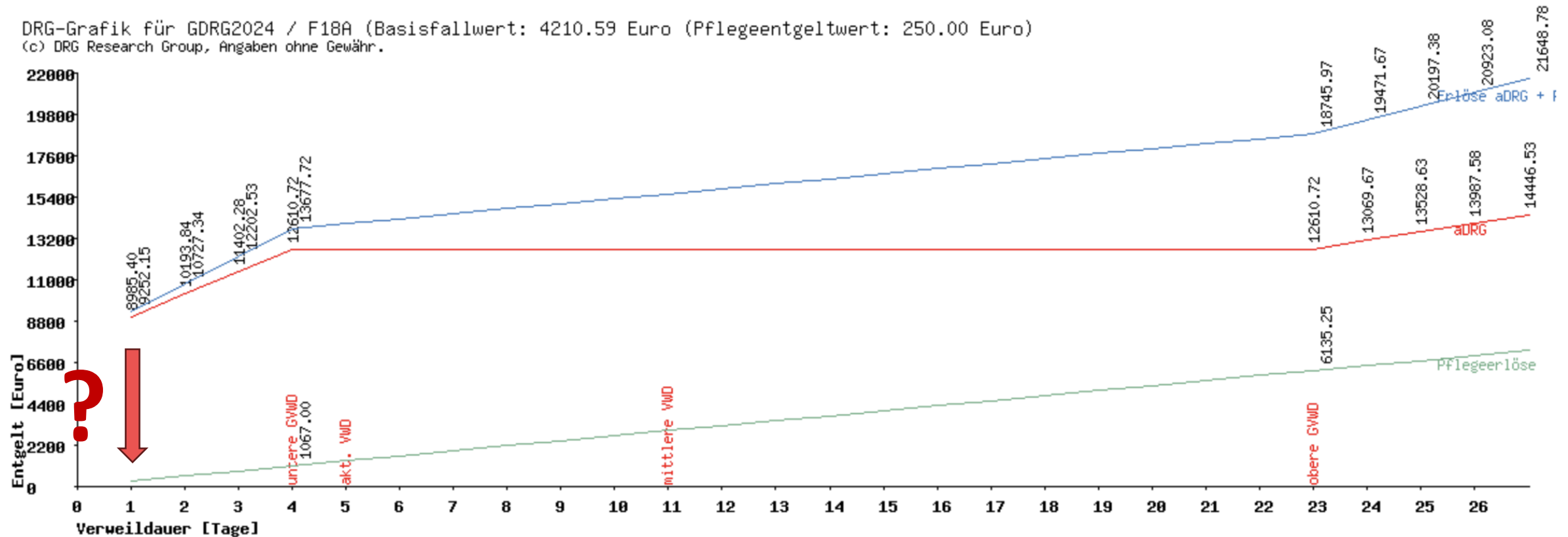
- Elective low-risk procedure
- **NO COMPLICATIONS** (COMPLICATIONS = SHOW-STOPPER)
- (Non-infectious indications)
- 3-4(-6) HOURS **adequate** post-procedure monitoring
- *Pre-discharge echocardiography*
- *Pre-discharge chest X-ray*
- SDD = shared decision
- Good social support
- Structured post-procedure instructions for patients & family
(What to watch out for? Phone numbers in case of questions/complications, etc.)
- Telemedical supported post-procedure **FOLLOW-UP** (especially 0-7 POD !!)

SAME-DAY TLE is
NOT
a door-opener for TLE
in any center

Here is the SHOW-STOPPER in Germany...

DRG-Grafik für GDRG2024 / F18A (Basisfallwert: 4210.59 Euro (Pflegeentgeltwert: 250.00 Euro))

(c) DRG Research Group, Angaben ohne Gewähr.



TAKE HOME messages

- **SD-TLE in Deutschland:** Theoretisch möglich, praktisch nicht... (*Stichwort: REIMBURSEMENT*)
- SD-TLE **NUR** für ausgesuchte Patienten...
- **SD-TLE** sollte unbedingt in spezialisierten TLE-Zentren durchgeführt werden!
- **SD-TLE** braucht ein klar definiertes **Protokoll** (KOMPLIKATIONEN = SHOW-STOPPER)
- **FOLLOW-UP** der Patienten **muss** gewährleistet sein & ist **AUFGABE** des TLE-Zentrums!
(**NO FIRE & FORGET...!**)



DEUTSCHES HERZZENTRUM
DER CHARITÉ

THANK YOU!

christoph.starck@dhzc-charite.de

DHZC Campus

Mitte

Charitéplatz 1

10117 Berlin

T: +49 30 450 - 50

DHZC Campus

Virchow-Klinikum

Augustenburger Platz 1

13353 Berlin

T: +49 30 4593 - 1000

DHZC Campus

Benjamin Franklin

Hindenburgdamm 30

12203 Berlin

T: +49 30 450 - 50

info@dhzc-charite.de | www.dhzc.charite.de

